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ABSTRACT

The translation of research findings into practical use has been a persistent problem in education. This paper describes a model that seeks to avoid some of the implementation and dissemination practices of the past--practices that produced disappointing results. The purpose of the study was to develop and test a model that brings together university researchers and classroom teachers in a collaborative endeavor to test, evaluate, and adapt research findings in classroom settings. The procedure described involved three steps. First a questionnaire on research interests was sent to a state-wide sample of science and mathematics teachers. Interest in knowing about research results was high among both junior high school and high school teachers; many teachers expressed an interest in being active participants in research. Next, survey results were presented to a group of local teachers who had been invited to a meeting to discuss ways to implement the translation of research into classroom practice. As a result of this meeting, a group of seven teachers and three faculty members was formed. Finally, a consensus was reached on operating procedures and principles. After study and discussion of research articles, reviews, and other materials, the teachers began trying out ideas from the readings and ideas of their own, reporting results at monthly meetings. (TW)

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Translating Research into Practice: A Model Linking University Researchers and Classroom Teachers

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The translation of research findings into practical use has been a persistent problem in education. Dissemination through workshops and conferences and the implementation of innovations by "experts" and consultants have often produced disappointing results. Researchers tend to assume that their findings can be used by teachers without further action on the part of the researcher while teachers tend to assume that research in science education is irrelevant and useless in the everyday world of the classroom. We believe that both assumptions are incorrect but that there is a vital step between research and practice. This step is somewhat analogous to the pilot testing that must be carried out when an industrial process that has been developed in the laboratory needs further testing before it can be put into production.

The model described in this paper brings together university researchers and classroom teachers as collaborators in testing, evaluating, and adapting research findings for classroom use. The model avoids the negative connotations attached by teachers to dissemination models that use "experts", usually university faculty members, to train teachers who are considered to be "novices".

Purpose:

To develop and test a model that brings together classroom teachers and university researchers in a collaborative endeavor to implement, evaluate, and adapt research findings in classroom settings.

This is not a model for conducting original, teacher-generated research; it is a model for conducting applied research that involves testing and adapting the results of research so that new ideas and teaching methods can be incorporated into classroom practice.

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Procedure:

Step I. Interest Survey

Step II. Planning

Step III. Implementation

These steps are described and summarized below.

Step I. Interest Survey

A questionnaire on the research interests of teachers was first distributed to those attending a workshop at a regional NSTA meeting. Although the sample was small, the respondents indicated a high level of interest. Based on this response, a larger survey was conducted.

Questionnaires were sent via department chairs to science and mathematics teachers at 15 randomly selected high schools and 15 randomly selected junior high or middle schools from each of the eight state regions and the seven largest cities in North Carolina.

Questionnaires were returned from approximately 70% of the high school teachers and 60% of the junior high school teachers, a total of 161 teachers from 11 high schools and 9 junior high schools.

Interest in knowing about research results was high. Ninety three percent of the junior high teachers and 96% of the high school teachers responded that they would like to know the results of research relevant to their subjects and grade levels.

Although approximately 80% of teachers had never participated in a research project and time was cited as a critical factor, over 60% responded that they would allow researchers to work with their students. Twenty-four percent of the high school teachers and 9 percent of the junior high or middle school teachers also indicated that they would like to be actively involved in planning and carrying out research projects in their classrooms.

Research areas that drew the most interest were: (1) teaching strategies, (2) how students learn and (3) how to plan instruction. Research on classroom organization and behavior management received little positive response. The lack of interest in behavior management corresponds to data from other sources that show that behavior management is not a major concern of experienced teachers in most school districts.

Overall, the results of the survey indicated that the majority of teachers of science and mathematics are interested in the results of research and many would like to be active participants.

Step II. Planning.

When the survey had been completed the results were presented to a group of local teachers who had been invited to a meeting to discuss ways to implement the translation of research into classroom practice. Teachers who expressed interest in working with a small group of university faculty members were invited to form a collaborative research group. As a result, a group of seven teachers and three faculty members was formed.

Step III. Implementation

At the initial meeting of the group the following understandings were arrived at:

- Participation is always voluntary
- Classroom teachers and university faculty members are equal partners in the enterprise
- Progress is reported by all participants at regular monthly meetings held after school
- The work carried out will be recorded as it happens

This initial group is composed of mathematics teachers and mathematics education faculty members collaborating to study the impact of computers on the high school mathematics curriculum. Research reports, articles, and curriculum materials were gathered by the researchers and studied together by the group. A grant for equipment from the IBM Corporation provided an IBM PC for each teacher to use in the classroom and an additional computer for each faculty member.

After study and discussion of research reports and other materials the teachers began trying out ideas from the readings and ideas of their own in their classrooms, reporting results at monthly meetings.

The group has met regularly for 18 months and has worked together for a three- or five-day workshop during each of the past two summers. The summer workshops, which were initially supported by the school district, were used to develop materials, to reflect upon experiences and to plan future work.

A second group is now in process of formation. This group originated from a class/workshop held on campus where research on cooperative learning was the subject of study, followed by classroom practice of the ideas presented through reading and discussion. The idea of the collaborative project has been presented to the group with an invitation to those who are interested to meet together to determine how the group will be formed, how collaboration will take place and other issues. This will give each teacher a basis for making a decision about

joining the group. Those who decide to join will carry out joint research projects with the active participation of university researchers, beginning in Fall '88.

Results

The first group has now produced a number of classroom curriculum materials for use in integrating the computer into the curriculum. They have received a grant from the National Science Foundation to continue their work in their own schools and to conduct peer training and dissemination of the results of their work. Requests for their materials have been received from across the state and, in making the results of research available to their colleagues, the teachers are being recognized as teacher leaders.

The second group, still in process of formation, will have counterparts at two other universities in the state. Each group will consist of teachers and one or more university faculty members. Groups from the three sites will hold joint meetings twice a year to discuss results of their work and to plan for the formation of additional groups. Faculty members leading these groups have received grants under ESEA Title II for teacher stipends during the training phase and for some support to attend a year-end joint conference.

With support from the two of the ten centers of the North Carolina Network of Mathematics and Science Education Centers, an annual statewide conference has been initiated to bring together teachers and others who are involved in and interested in practical applications of the results of research in a number of areas of interest. The second conference will be held in May 1988.

Conclusions

As shown by a survey and the experience of the past 18 months, there are teachers who are interested in forming collaborative groups with university researchers to test out in their classrooms ideas derived from research. They are willing to devote their own time to this type of project and are, in fact, stimulated and energized by an activity that is intellectually challenging and is perceived as useful. When results of research have been tested, evaluated and adapted to classroom use by teachers, the teachers can then introduce the innovations to their peers and colleagues. The advantage of having teachers as leaders and disseminators is that they have credibility with other teachers that no one else, however knowledgeable and well-intentioned, can attain.

We suggest that this is a practical and powerful way for NARST members to carry out the mission of the organization - the improvement of science teaching through research.

SURVEY RESULTS: RESEARCH INTERESTS OF TEACHERS

TABLE I - Respondents

	# Schools Responded	# Teachers Responded	# Math Teachers	# Science Teachers	Math & Science Teachers	Unknown
High Schools	11	105	62	37	4	2
Junior High	9	56	27	14	15	-
TOTAL	20	161	89	51	19	2

TABLE II - Teacher Background

	Junior High	High School
Highest Degree	38 BA 17 M Ed	61 BA 43 M Ed/MS
Now Enrolled in Degree Program	6 M Ed 1 Other	2 BS 11 M Ed/MS 3 PhD 1 Other
Not Enrolled	48	86
Years Taught		
0 - 1	6	4
2 - 5	11	15
6 - 10	13	22
- 10 ⁺	26	62

(over)

TABLE III - Results of Research

	Junior High	High School
Interested in Knowing Results of Research		
YES	52	101
NO	1	2
Dissemination		
Newsletter	31	48
Summaries	19	25
Workshops	16	31
CEU	9	16
College Credit	5	9

TABLE IV - Participation

	Junior High	High School
Have Participated in Research Project	12	18
Have Not Participated	44	80
Would Like to Participate	31	64
Would Not	19	35
Participation Levels		
Active	9	24
Cooperate/Inactive	7	10
Allow Researchers to Work With Students	10	40

TABLE V - Research Interest

	Junior High	High School
How Students Learn	18	35
Planning Instruction	15	23
Classroom Organization	11	9
Teaching Strategies	35	51
Other	7	14